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Niederman

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(54) **WRIST AND FOREARM STRENGTHENING DEVICE**

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See application file for complete search history.

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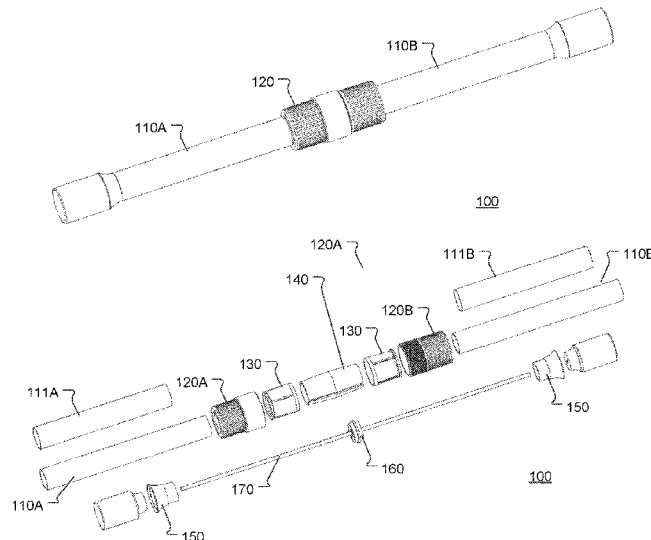
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(57) **ABSTRACT**

Embodiments of the present disclosure provide a wrist strengthening device having a first handle, a second handle and a tightening mechanism for increasing the resistance between the first handle, the second handle and the tightening mechanism.

13 Claims, 6 Drawing Sheets



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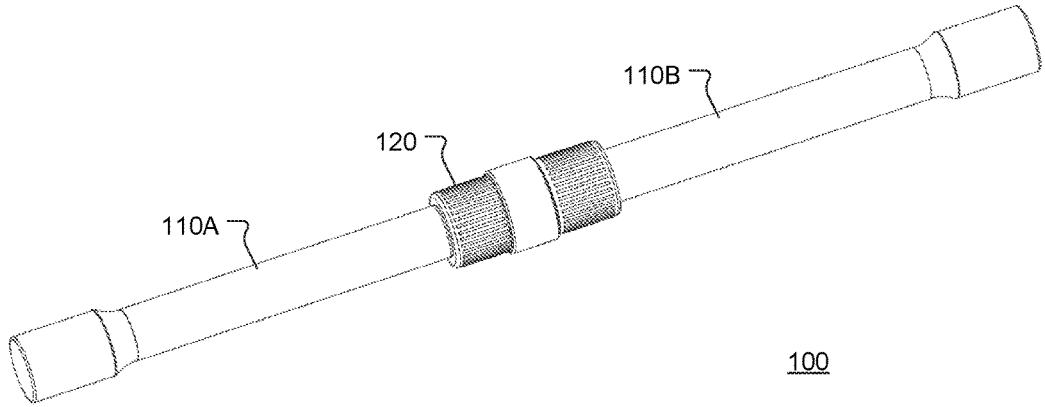


FIG. 1A

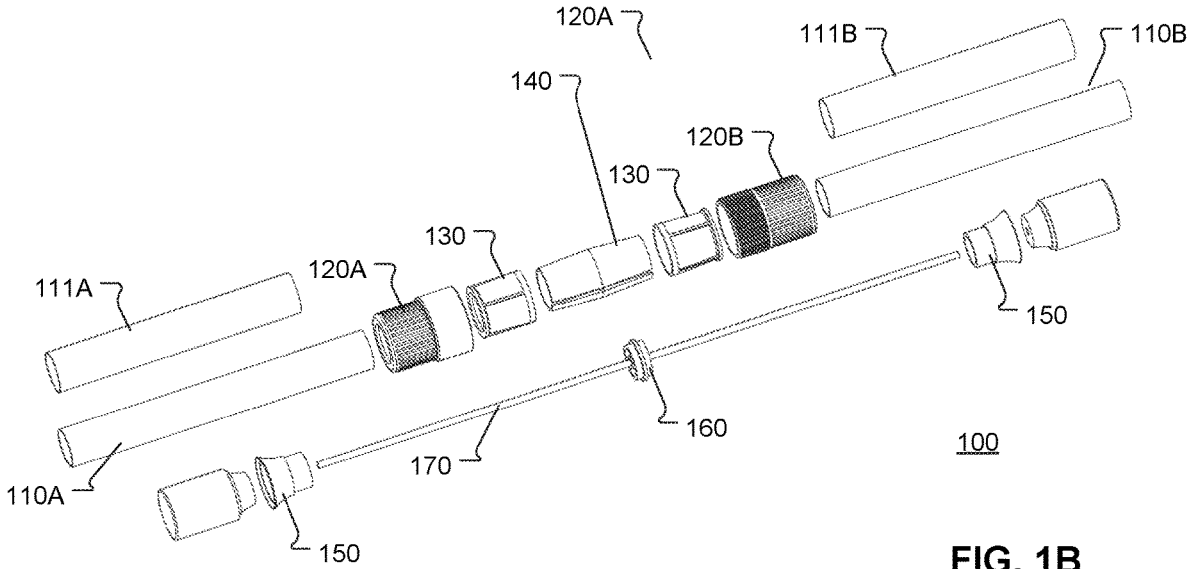


FIG. 1B

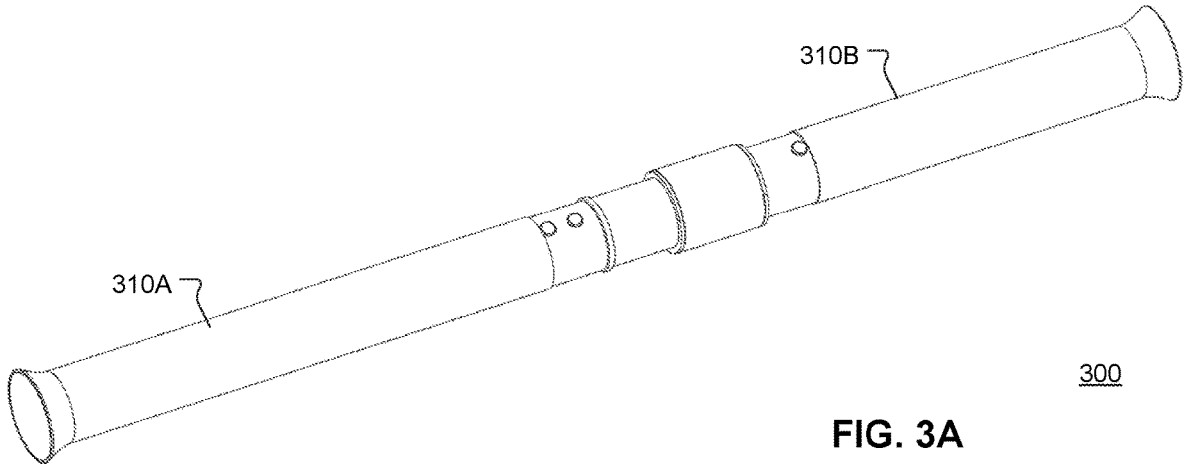


FIG. 3A

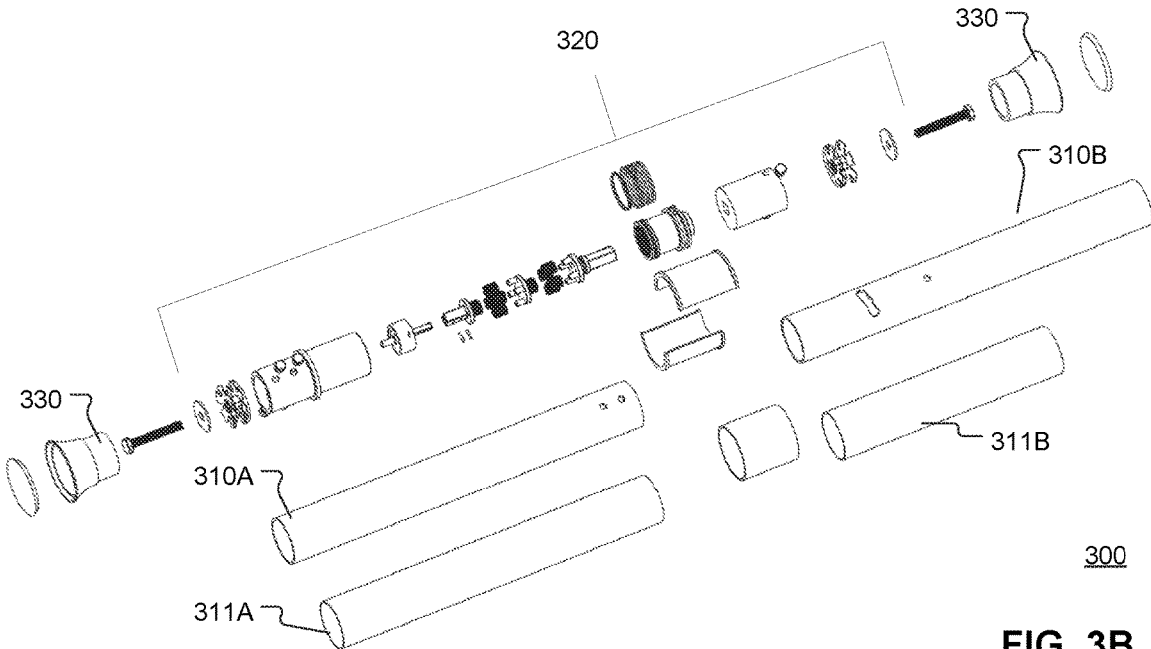
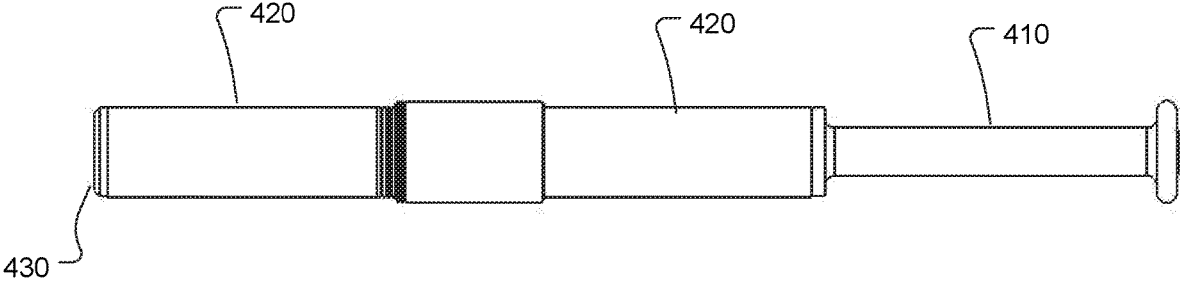


FIG. 3B



400

FIG. 4A

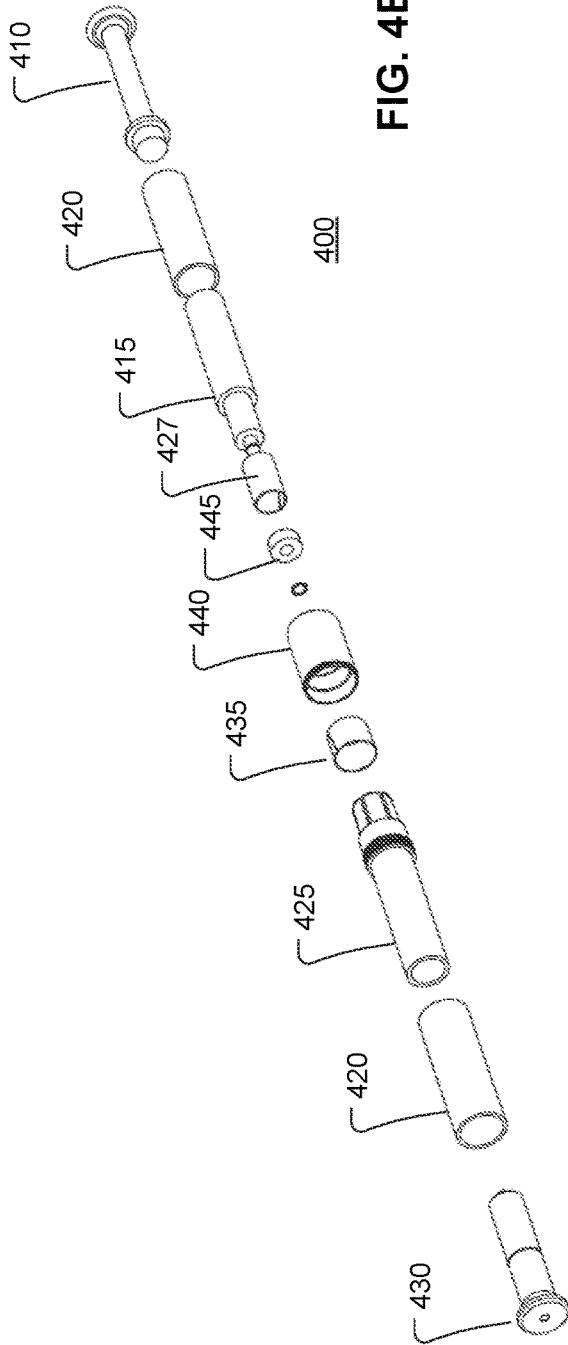


FIG. 4B

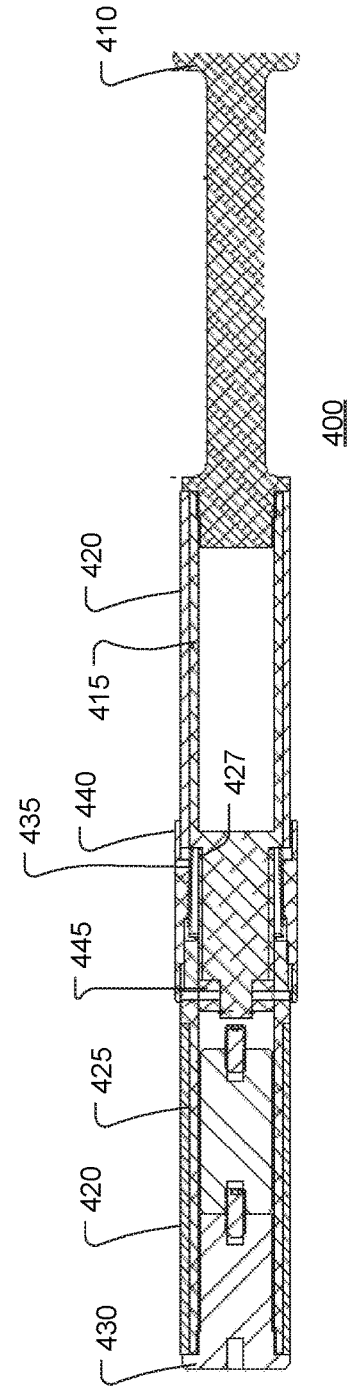


FIG. 4C

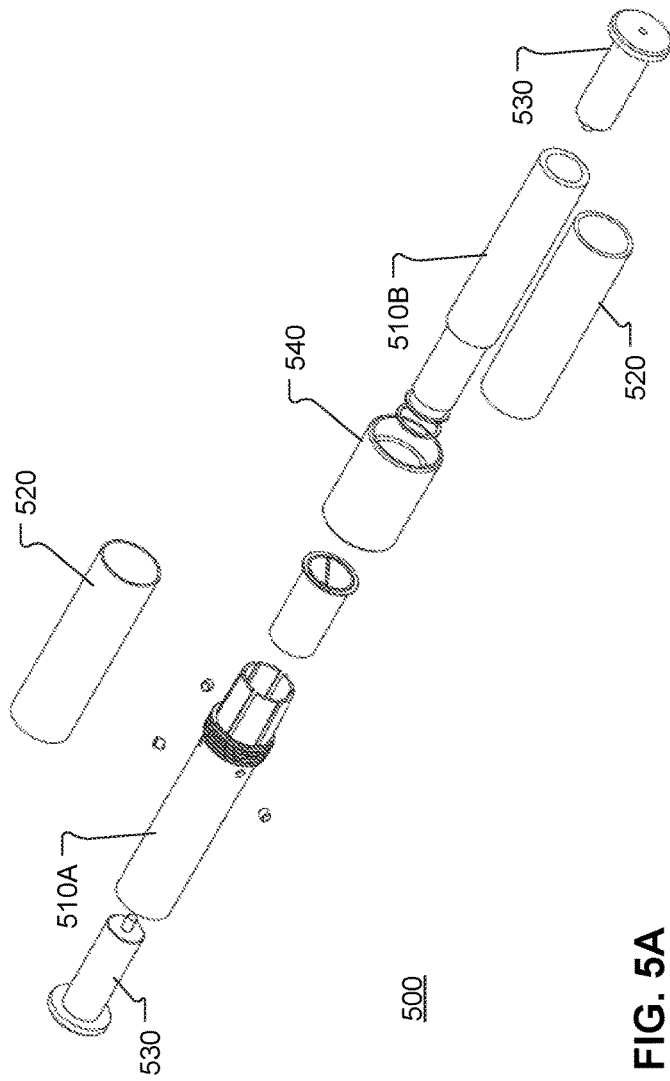


FIG. 5A

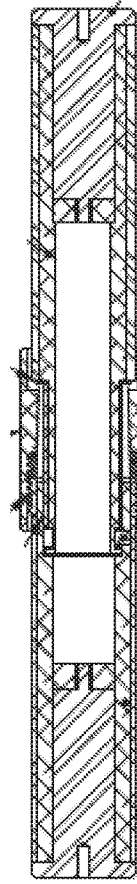


FIG. 5B

500

WRIST AND FOREARM STRENGTHENING DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a continuation of and claims priority to pending U.S. application Ser. No. 13/841,782, filed Mar. 13, 2013, which claims priority to U.S. Provisional Application No. 61/658,252 filed on Jun. 11, 2012 entitled Wrist and Forearm Strengthening Device. Each of the aforementioned applications is incorporated by reference in their entirety.

BACKGROUND

For certain activities, wrist strength may affect the performance of an individual. For example, in sports such as golf, baseball or tennis, wrist strength and/or forearm strength may affect the velocity with which the ball may be driven. Likewise, in basketball wrist and forearm strength may affect the range at which a player may shoot the ball. Similarly, in gymnastics, wrist strength may affect the overall performance of the gymnast. Typical wrist exercises include the use of dumbbells or wrist rollers. However, these devices are often cumbersome and may be inaccessible to the general public.

BRIEF SUMMARY

This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description section. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

Embodiments of the present disclosure provide a wrist strengthening device having a first handle, a second handle and a tightening mechanism for increasing the friction between the first handle, the second handle and the tightening mechanism. Other embodiments described herein include a wrist strengthening device comprising a first handle, a second handle that is coupled to the first handle, and a mechanism having at least one conical component. In such an embodiment, the conical component is configured to increase friction between the first handle and the second handle as the first handle is moved in a first direction and as the second handle is simultaneously moved in a second direction that is opposite from the first direction. In still yet other embodiments, a wrist strengthening device is provided having a first handle, a second handle and a planetary gearbox configured to move a liquid in response to a rotation of either the first handle or the second handle.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features, aspects, and advantages will become better understood by reference to the following detailed description, appended claims, and accompanying figures, wherein elements are not to scale so as to more clearly show the details, wherein like reference numbers indicate like elements throughout the several views, and wherein:

FIGS. 1A and 1B illustrate a wrist strengthening device according to a first embodiment of the present disclosure;

FIGS. 2A-2B illustrate a wrist strengthening device according to a second embodiment of the present disclosure;

FIGS. 3A-3B illustrate a wrist strengthening device according to a third embodiment of the present disclosure;

FIGS. 4A-4C illustrate a wrist strengthening device according to a fourth embodiment of the present disclosure; and

FIGS. 5A-5B illustrate a wrist strengthening device according to a fifth embodiment of the present disclosure.

DETAILED DESCRIPTION

Various embodiments are described more fully below with reference to the accompanying drawings, which form a part hereof, and which show specific exemplary embodiments. However, embodiments may be implemented in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the embodiments to those skilled in the art. The following detailed description is, therefore, not to be taken in a limiting sense.

FIGS. 1A-1B illustrate a wrist strengthening device **100** according to an embodiment of the present disclosure. Specifically, FIG. 1A illustrates an isometric view of the wrist strengthening device **100** and FIG. 1B illustrates an exploded isometric view of the wrist strengthening device **100**. As shown in each of FIGS. 1A and 1B below, the wrist strengthening device **100** is springless. The embodiments disclosed herein rely on friction to create a resistance that may be used to strengthen the wrists and/or forearms of a user. For example, as the handles of the wrist strengthening device **100** are twisted in opposite directions, friction is created and as the amount of friction increases, the user is required to exert an increased amount of force, which in turn, strengthens the user's wrists and/or forearms. In an embodiment, one or more components of the device **100** may be configured to increase resistance of one handle without increasing the resistance of the other.

In certain embodiments, the wrist strengthening device **100** includes two handles **110A** and **110B** which are joined together via a centerpiece **120**. Each of the handles **110A** and **110B** are configured to rotate in opposite directions. Thus, for example, if handle **110A** is rotated in a clockwise direction, handle **110B** is moved in a counter-clockwise rotation. In certain embodiments, the handles **110A** and **110B** may be moved in opposite directions simultaneously or substantially simultaneously. In certain embodiments, the handles **110A** and **110B** are coated with a gripping material **111A** and **111B** (FIG. 1B) such as, for example, rubber or other elastomeric materials, leather, shrink tubing and the like, that allows a user to more easily grip the handles **110A** and **110B** while also providing a comfortable grip for the user.

As shown in FIG. 1B, the centerpiece **120** includes a male portion **120A** and female portion **120B**. The centerpiece also includes one or more conical pieces **130** and a center conical piece. As the female portion **120B** is moved toward the male portion **120A** in response to a twisting motion, the conical pieces **130** are moved inward toward the center conical piece **140**. As the conical pieces **130** are moved together and the space between the center conical piece **140** and the conical pieces **130** decreases, the amount of friction increases. As discussed above, as the amount of friction increases, a user may be required to exert more force. Once the user has reached the desired amount of friction or the female portion **120B** has completely mated with the male portion **120A**, the

user may rotate the handles in the opposite direction to decrease the friction and the process may be repeated.

As shown in FIG. 1B, the wrist strengthening device 100 may also include end caps 150. In certain embodiments, the end caps may be used to add weights or other attachments to one or both ends of the wrist strengthening device 100. In 5 embodiments, the weights may include any material that adds additional weight to the device including lead, sand, water filled apparatus etc. In certain embodiments, each of the end caps 150 may have one or more orifices (threaded or non-threaded) that may be used to secure one or more weights to the wrist strengthening device 100. If weights are added in such a manner, the user may grip one of the handles of the wrist strengthening device 100 and, using a casting 15 motion, perform additional wrist strengthening exercises for a single wrist.

For example, if weights are added to one of the end caps 140, a user may hold the wrist strengthening device 100 in an upright position (with the added weights on a distal end of the wrist strengthening device 100) and use a casting 20 motion (e.g., moving the distal end of the wrist strengthening device from a first position near the body to a second position away from the body) to exercise the wrist. The added weights cause the user to exert more force as the user 25 performs the casting motion.

In an embodiment, the wrist strengthening device 100 may also include a spacer 160 and a rod 170. In certain embodiments, the spacer 160 is used to keep the ends of the handles 110A and 110B from rubbing against each as a result of the twisting motion. Likewise, the rod 170 is used 30 maintain the structure of the wrist strengthening device 100.

FIGS. 2A-2B illustrate a wrist strengthening device 200 according to a second embodiment of the present disclosure. Specifically, FIG. 2A illustrates an isometric view of the wrist strengthening device 200 and FIG. 2B illustrates an exploded isometric view of the wrist strengthening device 200. As with the wrist strengthening device 100 (FIG. 1A), the wrist strengthening device 200 is entirely springless and 40 relies on friction to strengthen a user's wrists and/or forearms.

In certain embodiments, the wrist strengthening device 200 includes two handles 210A and 210B which are joined together via a centerpiece 220. As with the wrist strengthening device 100, each of the handles 210A and 210B of the wrist strengthening device 200 are configured to rotate in 45 opposite directions. Additionally, the handles 210A and 210B may be covered with a gripping material 211A and 211B (FIG. 2B) such as an elastomeric material, leather, shrink tubing and the like.

In certain embodiments, the centerpiece 220 is a clamping mechanism that may be tightened or loosened by a user using a tightening mechanism 225. Although two tightening mechanisms 225 are shown, it is contemplated that any number of tightening mechanisms 225 may be used. As the 55 tightening mechanism 225 is tightened, the centerpiece 220 closes around at least a portion of each of the handles 210A and 210B which increases the friction between the handles 210A and 210B and the centerpiece 220. As a result, the user is required to exert more force in the twisting motion used to rotate the handles 210A and 210B. 60

FIG. 2B, illustrates an exploded isometric view of the wrist strengthening device 200. As shown in FIG. 2B, the centerpiece 220 may include a sleeve 222 that may be used to both protect the handles 210A and 210B as well as to 65 assist in increasing the friction between the handles 210A and 210B and the centerpiece 220.

In certain embodiments, the wrist strengthening device 200 may also include end caps 230 that may be used to add weights or other attachments to the wrist strengthening device 200 such as was described above. Additionally, the wrist strengthening device 200 may include a spacer 240 and a rod 250 that are used to keep the ends of the handles 210A and 210B from rubbing against each other and to maintain the structure of the wrist strengthening device 200.

FIGS. 3A-3B illustrate a wrist strengthening device 300 according to a third embodiment of the present disclosure. Specifically, FIG. 3A illustrates an isometric view of the wrist strengthening device 300 and FIG. 3B illustrates an exploded isometric view of the wrist strengthening device 300. As with the wrist strengthening device 100 (FIG. 1A) and the wrist strengthening device 200 (FIG. 2A), the wrist strengthening device 300 is entirely springless. However, wrist strengthening device 300 utilizes a planetary gearbox 320 (FIG. 3B) to move hydraulic oil or other such substance from a first position to a second position. For example, the planetary gearbox 320 may include a plurality of chambers. As the handles are rotated, the liquid moves from a first chamber to a second chamber. In certain embodiments, the liquid may be required to pass through an opening between the chambers. Additionally, the opening between the chambers may be adjustable by a user. 10

As shown in FIG. 3A, the wrist strengthening device 300 includes two handles 310A and 310B which are coupled together. In certain embodiments, the handles 310A and 310B are coupled together using various rivets of the planetary gearbox 320. As was briefly described above, as a user twists each of the handles 310A and 310B of the wrist strengthening device 300, the twisting motion causes the gears of the planetary gearbox 320 to rotate which in turn drives an impeller which causes the hydraulic oil to move. Movement of the oil creates resistance to rotation of the handles which in turn, strengthens a user's wrists and/or forearms as the user continues to exert a force for the twisting motion. In certain embodiments, a user may be able to adjust the size of a hole through which the liquid travels to increase and/or decrease the resistance of the twisting motion. 20

FIG. 3B, illustrates an exploded isometric view of the wrist strengthening device 300 including the various components of the planetary gearbox 320. As also shown in FIG. 3B, the handles 310A and 310B of the wrist strengthening device 300 may be covered with a gripping material 311A and 311B such as an elastomeric material, leather, shrink tubing and the like. The wrist strengthening device 300 may also include end caps 330 that may be used to add weights or other attachments such as was described above. 30

FIGS. 4A-4B illustrate a wrist strengthening device 400 according to a fourth embodiment of the present disclosure. Specifically, FIG. 4A illustrates a wrist strengthening device 400 that includes a handle 410. In embodiments shown, the handle 410 is in the shape of a baseball bat. However, it is contemplated that handles from various sporting equipment types may be used, such as, for example, a tennis racket handle, lacrosse stick handle, hockey stick handle, golf club handle and the like. In certain embodiments, the handle 410 is removable such that the various handles from the different sporting equipment may be interchanged. It is also contemplated that the handle 410 for each piece of sporting equipment is equivalent to one or more standard sizes of the sporting equipment. For example, a baseball bat handle for a youth size may be $\frac{7}{8}$ ", a small size may be $\frac{15}{16}$ ", a medium size may be $\frac{3}{2}$ ", and a large size may be 1" or greater. In certain embodiments, the length of the handles is approxi- 40

mately 6.5" and the length of the device **400** is approximately 21". Although specific widths and lengths have been mentioned, it is contemplated that other widths and lengths in various combinations may be used. Additionally, as discussed above, various sizes may be used for each respective piece of sporting equipment handle. It is also contemplated that the handle may be coated with or include one or more gripping materials or gripping agents. As the handle **410** is equivalent in size to an actual piece of sporting equipment, a user training with the device **400** may feel like they are training with an actual piece of sporting equipment.

Device **400** also includes grips **420** on opposing ends of the device **400**. In certain embodiments where the handle **410** is removable, the device may be used as a wrist strengthening device such as described above with respect to FIGS. 1A-3B. That is, a user may grip each of the grips **420** and rotate each of the handles around an axis of the device **400** such as described above. Additionally, each of the embodiments described above may be configured to receive a removable handle such as handle **410**.

In certain embodiments, the device **400** may also include one or more weights **430** that may be inserted and removed from a top portion of the device **400**. The weights may be configured in various shapes, weight and sizes and fit either into or on top of various portions of the device **400**.

FIG. 4B illustrates an exploded isometric view of the device **400** according to embodiments of the present disclosure. As discussed, device **400** may include a handle **410**. In certain embodiments the handle **410** is removably attached to an inner insert portion **415** of the device **400**. In embodiments a grip **420** comprised of a gripping material (e.g., rubber) is overlaid on the inner insert portion **415** to provide extra grip to a user.

The device **400** also includes a clamp insert **425** that is configured to be coupled with a handle bearing **427** of the inner insert **415**. In certain embodiments, When connected, a lock bearing **435** is coupled to the handle bearing **427** and the inner insert **415** which, when tightened, provides resistance to the clamp insert **425**. A collar **440** provides a mechanism whereby a user can tighten and loosen the clamp insert **425** to provide more or less resistance to a twisting motion that causes the handles to rotate around an axis of the device **400**. As shown, a retainer bearing **445** may be used to hold each of the above identified portions in place when the device **400** is assembled. FIG. 4C illustrates a cross-sectional view of the device **400** when each of the components described above have been assembled.

FIGS. 5A-5B illustrate a wrist strengthening device **500** according to a fifth embodiment of the present disclosure. As shown in FIG. 5A, the wrist strengthening device **500** includes handle tubing **510A** and **510B**. In embodiments, the handle tubing **510A** and **510B** may be hollow or partially hollow to enable the insertion of one or more weights **530** in an open end of the handling tubing **510A** and **510B**. One or more screws may be used to hold the weights in place. In another embodiment, the weights, or portions thereof, may have one or more connection means (threads, magnets, clips, snaps and the like) whereby the weights may be stabilized within the handle tubing **510A** and **510B**. As also shown, at least one handle tubing **510A** has a series of threads on which a tension ring **540** may be placed. In embodiments, the tension ring **530** may be used to increase tension of the wrist strengthening device **500**. The wrist strengthening device **500** may also have gripping material **520** coupled to each of the handle tubing **510A** and **510B**. As also shown in FIG. 5A, one or more bearings may be used to ensure the

handle tubing **510A** and **510B** are able to rotate about their respective axis when a twisting motion is used by a user.

As with other embodiments described herein, one or more handles (i.e., sporting equipment handles) may be removably coupled to the wrist strengthening device **500**. In other embodiments, other attachment mechanisms may be attached such as, for example, additional weights. FIG. 5B illustrates a cross-sectional view of the wrist strengthening device **500** when each of the components described above have been assembled.

The description and illustration of one or more embodiments provided in this application are not intended to limit or restrict the scope of the claims in any way. However, one skilled in the relevant art may recognize that the embodiments may be practiced without one or more of the specific details, or with other resources, materials, etc. The embodiments, examples, and details provided in this application are considered sufficient to convey possession and enable others to make and use the best mode of the claimed subject matter. The claimed subject matter should not be construed as being limited to any embodiment, example, or detail provided in this application. Regardless of whether shown and described in combination or separately, the various features are intended to be selectively included or omitted to produce an embodiment with a particular set of features. Having been provided with the description and illustration of the present application, one skilled in the art may envision variations, modifications, and alternate embodiments falling within the spirit of the broader aspects of the general inventive concept embodied in this application that do not depart from the broader scope of the claims.

What is claimed is:

1. A wrist strengthening device, comprising:
 - a first handle;
 - a second handle coupled to the first handle; and
 - a tightening component coupled to the first handle and the second handle and adapted to provide resistance to movement of the first handle and the second handle as the first handle is moved in a first direction and the second handle is moved in a second direction, opposite the first direction, the tightening component comprising a conical component adapted to apply pressure to an inner component, wherein the tightening component includes a male and a female portion, the inner component is a center conical piece, the conical component includes first and second conical pieces, and wherein movement of the male portion towards the female portion causes the first and second conical pieces to apply pressure against the center conical piece.
2. The wrist strengthening device of claim 1, the tightening component comprising:
 - a clamp insert having the conical component adapted to apply pressure to the inner component, the inner component being an inner insert, and
 - a collar, surrounding the clamp insert, adapted to tighten and loosen the conical component against the inner insert, wherein twisting the collar effects inward radial pressure from the conical component to the inner insert.
3. The wrist strengthening device of claim 2, wherein:
 - the clamp insert is coupled with the first handle,
 - the inner insert is coupled with the second handle, and
 - the collar is located between the first handle and the second handle.

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4. The wrist strengthening device of claim 1, wherein at least one of the first handle or the second handle includes an opening on a distal end, and wherein the opening is configured to receive one or more weights.

5. The wrist strengthening device of claim 1, further comprising a detachable handle, wherein the detachable handle is adapted to be received in at least one of the first handle or the second handle.

6. The wrist strengthening device of claim 1, wherein the first handle is configured to be moved simultaneously with the second handle.

7. The wrist strengthening device of claim 1, wherein the first handle and the second handle comprise a gripping material.

8. The wrist strengthening device of claim 1, wherein the tightening component is configured to provide resistance to either one of the first handle or the second handle without providing resistance to the other one of the first handle or the second handle.

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9. The wrist strengthening device of claim 1, the tightening component further comprising a handle bearing located between the conical component and the inner insert.

10. The wrist strengthening device of claim 9, the tightening component further comprising a retainer bearing adapted to hold the clamp insert, handle bearing, inner insert, and collar in place when the wrist strengthening device is assembled.

11. The wrist strengthening device of claim 1, the tightening component further comprising a lock bearing located between the collar and the conical component.

12. The wrist strengthening device of claim 11, the tightening component further comprising a handle bearing located between the conical component and the inner insert.

13. The wrist strengthening device of claim 12, the tightening component further comprising a retainer bearing adapted to hold the clamp insert, handle bearing, inner insert, and collar in place when the wrist strengthening device is assembled.

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